odds ratio for exceeding the overall median was 1.0 (95% CI: 0.64–1.55). **CONCLUSION:** Pharmaceutical CUAs account for almost half of all published CUAs. The quality of studies does not appear to differ according to study sponsor. In the published literature, the cost-effectiveness of pharmaceuticals is similar to that of other interventions.

PMC6

THE $50,000/QALY THRESHOLD RECONSIDERED: A RETROSPECTIVE ON KLARMAN'S ORIGINAL PAPER WITH AN EYE TO THE FUTURE

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It has been 40 years (1968) since Herbert Klarman and colleagues published their paper in Medical Care establishing that the cost-effectiveness of kidney dialysis is $50,000/QALY. This served as the basis for expanding the United States Medicare program to provide universal coverage for end stage renal disease and subsequently the basis upon which all new health technology has been compared. This standard has not changed throughout the health technology assessment community despite years of inflation and structural changes in health care systems since this time. This paper will first re-examine Klarman's work and show how he quality-adjusted the life years in the wrong direction—producing ill-year rather than healthy-year equivalent years; therefore, he grossly underestimates the cost-effectiveness ratio associated with kidney dialysis. The implication of this mistake for health technology assessment and some suggestions for new CE threshold standards will be discussed. Current conditions in health technology assessment require that these new standards be both dynamic—allowing for change over time—and flexible to allow adjustment based on mitigating factors like budget impact. Several examples and evidence from Australia, the UK and the United States will be presented to indicate how these standards might be developed.

PMC7

TOTAL DIRECT MEDICAL EXPENDITURE OF CHRONIC DISEASES UNDER DIFFERENT ECONOMETRIC MODELS

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OBJECTIVE: Quantify effect of alternative econometric models, in estimating total direct medical expenditure in diabetes, arthritis, cardiac diseases, asthma, hypertension, stroke, and emphysema. **METHODS:** Data from the MEPS's Household Component (2004), a nationally representative survey of the U.S. civilian noninstitutionalized population, was used. Accounting for the survey's clusters, strata and sampling weights; total direct medical expenditure was estimated under 11 different econometric models to assess their sensitivity to the zero mass, non-negative values and skewed distribution. Models compared were, OLS on raw-expenditure (OLSraw); OLS on log-expenditure (LnHom) and homoskedastic-retransformation; OLS on log-expenditure (LnHet) and heteroskedastic-retransformation; GLM with log-link and Gamma-family (GLMGam); GLM with log-link and Poisson-family (GLMPoi); Extended Estimating Equations (EEE); and 2-part models of OLSraw (2POLSraw); LnHom (2PLnHom); LnHet (2PLnHet); GLMGam (2PGLMGam); and GLMPoi (2PGLMPoi). Incremental expenditure from the method of recycled predictions summed over diseased population gave total expenditure. Box-Cox test confirmed log-link for GLM models while Modified Park's test determined a distribution between the Poisson and the Gamma for the family. LINK, RESET and Hosmer-Lemeshow test determined model fit, while COPAS test was employed for over-fitting and cross validation. Covariates included age, gender, race, ethnicity, marital status, education, insurance status, and comorbidity. **RESULTS:** Total expenditure in billions (b) of dollars, for diabetes ranged from $48.5b(2POLSraw) to $127b(LnHet). Similarly, expenditure of arthritis ranged from $73b(2POLSraw) to $196b(LnHet); cardiac diseases ranged from $99.2b(2POLSraw) to $194b(LnHet); asthma ranged from $27.8b(2POLSraw) to $64.2b(GLMGam); emphysema ranged from $2.1b(2PLnHom) to $18.4b(LnHet); hypertension ranged from $69.9b(2POLSraw) to $241b(LnHet) and stroke ranged from $13.1b(2PLnHom) to $39.3b(LnHet). LnHet model was consistently associated with the highest total expenditure estimate, while 2POLSraw model typically predicted the lowest estimate. **CONCLUSION:** The strong influence of model choice on the total medical expenditure estimate, underscores importance of understanding the data generation procedure before selection of the appropriate estimator.

PMC8

A CONCEPTUAL FRAMEWORK TO ANALYZE A DISEASE'S WORKPLACE IMPACT ON AN EMPLOYER

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OBJECTIVES: A disease's workplace impact on an employer is often highly sought but rarely available information that an employer can use to understand the value of a health intervention and to influence health insurance coverage of that intervention. This document presents a conceptual framework to analyze a disease's workplace impact on an employer. **METHODS:** The conceptual framework presented here was developed on the basis of a comprehensive literature review, extensive consultation process, analytical mapping of concepts, objects, behaviors, domains, functions, and relationships, as well as real case analyses. **RESULTS:** A four-component conceptual framework of workplace impact of a disease is proposed to guide researchers to quantify disease-workplace-impact from an employer perspective. These four components are work interruption costs, work care costs, worker turnover costs and productivity reduction costs. The examples of work interruption costs include employer-paid medical leaves, absence, short-term disability, and other forms of work interruption resulted from a disease. The examples of work care costs include disease related work adaptation costs, and a disease related insurance premium increase. The examples of worker turnover costs include worker separation costs, new worker recruitment costs, and new worker training costs. The productivity reduction costs are mainly the costs of productivity decrease resulted from presenteeism. Both predisposing factors and intervening factors of workplace impact are discussed in this conceptual framework. Based on this conceptual framework, we conducted a real world case analysis, which suggests not only significant workplace impact of a debilitating disease, but also some methodological challenges in estimating workplace impact of a disease from an employer's perspective. **CONCLUSIONS:** Our four-component conceptual framework can guide researchers to quantify workplace impact of a disease from an employer's perspective. The real case analysis suggests a debilitating disease not only affect patients, but also exert significant workplace impact on an employer.